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ABSTRACT

A program structure relates objectives and activities by identifying and measuring objectives (including all activities) and by allowing for growth. The process of program structuring categorizes the activities of education into programs according to their contribution to meeting education objectives and provides a format for the program budget. This planning achieves better educational results by using resources more effectively. (Author/RA)

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THE PROGRAM STRUCTURING ASPECT OF PPB FOR EDUCATION

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Program structuring--categorizing the activities of education into programs based on their contribution toward meeting the objectives of education--is an iterative process. As the objectives are initially identified and the program structure is developed, the process serves to clarify the objectives. This clarification, in turn, facilitates the program structuring.

The process is continued with the goal of achieving a workable program structure. The program structure then provides a format for the program budget. The program budget, itself, is a display of the expenditure consequences, over time, of activities resulting from current policies and decisions. Combining this with the program plan, which includes output measures, results in an organized information base--an informational framework--that is useful in assessing current programs and in evaluating the alternatives in terms of their impact on the cost and effectiveness of all the programs. This is in keeping with the overall concept of PPB as a management tool in educational planning. The purpose of the planning is not only to achieve better educational results but also to use resources more effectively.

The activities of program structuring and their relationship to other activities in implementing PPB are shown in Fig. 1. The central location of these activities involved in developing the program structure is not accidental. The structure is based on the needs, the goals,

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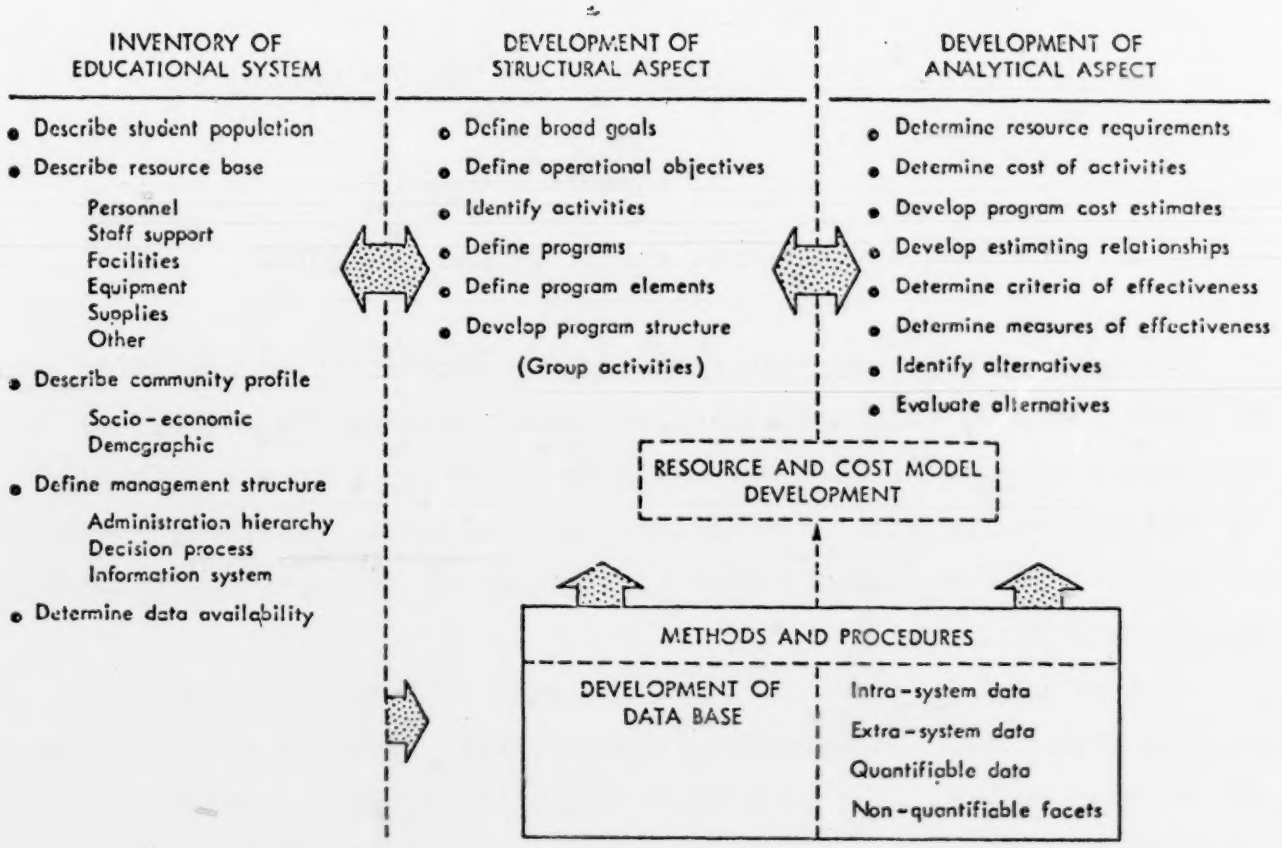

Fig. 1--Schematic of activity areas in the development of a program budgeting system

the objectives, and the activities of the district.

The program structure, through programs, relates activities (and their resources) to objectives. The meaning of the word "objective" as used in this discussion of the program structuring process should be made clear. The term "objective" is used as a broad, but still measurable, goal or purpose rather than a performance objective or behavioral objective. Schematically, the nature of the program structure might look like that in Fig. 2. The program structure organizes information about cost and effectiveness of programs, subprograms, and program elements. This organization reflects the goals and purpose of the educational system.

Both the nature and the role of the program structure have changed since PPB was first introduced. The change can be traced through the directives, issued since 1965, of the former Bureau of the Budget. In Directive 66-3 of October 12, 1965, the program structure was "a series of output-oriented categories which, together, cover the total

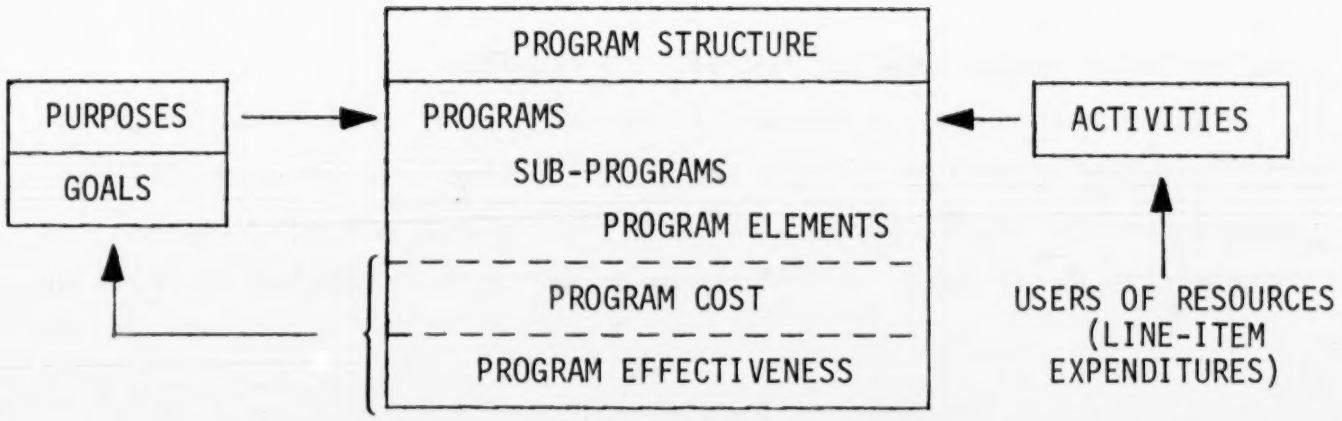

Fig. 2--Nature of the program structure

work of the agency." In the Directive 68-2 of July 18, 1967, this statement was made: "The program structure groups the activities of an agency into a set of program categories that facilitates analytic comparisons of the costs and effectiveness of alternative programs." Analysis is explicitly mentioned. In April of 1968, Directive 68-9 added the idea of the program structure in support of the decision-making process.

Thus, today there is an emphasis on developing a program structure that is *closely tied to the decisions to be made* at different levels of decisionmaking. In decisions about matters of purpose and direction, what should be done? How is it being done? How well is it being done? In addition to being closely tied to the decisions to be made, the program structure should be designed to support the analytical aspect of PPB. If it is not, the result of the PPB effort will, in all likelihood, be just a new accounting system.

In supporting the analytical aspect of PPB, the program structure should be organized to reflect information about the main areas of choice--areas of choice being output-oriented programs at the higher decision levels and program elements at the lower decision levels. In short, program structures should provide informational support for decisions at the highly aggregated level and the lower, more detailed level of operation, such as particular instructional program elements. In addition, these output-oriented programs should be a categorization of all the activities of the district. This categorization should, as stated earlier, be based on the contribution of

the activity toward meeting specific objectives.

These points can be summarized by looking at some characteristics of a program structure. These are shown in Fig. 3. The characteristics under the broad heading, "Relates Objectives and Activities," are fairly straightforward, if the usage of the word objective is recalled.

Relates Objectives and Activities

- o Identifies objectives
- o Provides measurable objectives
- o Includes all activities
- o Allows for growth (flexibility)

Supports Decisionmaking

- o Illuminates priorities
- o Highlights trade-off areas
- o Promotes realistic analysis
- o Provides for imaginative change
- o Is manageable

Fig. 3--Characteristics of a program structure

The fourth item, "allows for growth or flexibility," will be discussed later. In general, these are the characteristics of a program structure that make a program structure, and the resulting program budget, a useful information display. Information is provided about what is being done and how the resources are allocated.

The characteristics listed under "Supports Decisionmaking" require more explanation. An explanation is most easily provided by asking questions about a few currently used or illustrative program structures. The discussion of these program structures will then be followed by the presentation of a proposed program structure for education.

The HEW program budget is shown, in part, in Fig. 4, and an illustrative program structure for a state department of education is shown in Fig. 5. Notice not only the broadness of the programs, but also the fact that the programs reflect the areas of choice within the jurisdiction of the different levels--the Federal and the state level.

PROGRAM DISTRIBUTION OF BUDGET AUTHORITY
(In $ millions)

Program Category and Subcategory	*1968 Actual*	*1969 Estimate*	*1970 Estimate*
Education			
Development of basic skills	2,380.0	2,289.3	2,179.0
Development of vocational and occupational skills	269.3	268.3	304.1
Development of academic and professional skills	1,330.9	966.2	1,020.7
Library and community development	87.9	86.8	96.0
General research (nonallocable research)	25.7	25.6	31.1
General support	35.5	41.3	45.3
Total	4,138.3	3,677.5	3,676.2
Health			
Development of health resources	2,315.0	2,185.7	2,395.6
Prevention and control of health problems	457.1	480.8	480.5
Provision of health services	7,345.7	9,980.3	10,739.0
General support	48.5	54.9	64.4
Total	10,166.5	12,701.8	13,679.4

Fig. 4--Partial program budget for the Department of Health, Education and Welfare

- o Provide general support of school districts.
  - Support for current operations.
  - Support for facilities acquisition.
- o Equalize educational capability of school districts.
- o Support special programs.
  - Designated categories of students.
  - Designated programs.
- o Provide central educational services.
- o Provide central administrative services.
- o Support educational research and development
- o Coordinate Federal programs.
- o Administration.

Fig. 5--Illustrative program structure for a state Department of Education

Each of the few broad programs of these two program structures cover many program elements whose activities contribute toward meeting the purpose of the broad program. Notice the relatively small number of programs that encompass all the activities. Six programs in the "E" of HEW cover an expenditure of approximately $4 billion. In the

illustrative state-level program structure, there is only a slight increase in the number of programs. But again, these programs are the areas of choice within the jurisdiction of a state department of education.

The number of programs has been mentioned. Why is this important? Remember that the program budget is, in part, a display device geared to organizing information in support of the decisionmaker. The decisionmaker is a human being with a limit in his ability to comprehend and act on the information in a massive display of detailed data about every facet of numerous activities. This logical and necessary limitation on the number of programs in a program structure translates into one of the characteristics of a good or workable program structure--a manageable number of programs.

The Pearl River Program structure is shown in Fig. 6. Imagine a

Program Code	*Program Description*
	Basic Instructional Services
60	Language arts, including English and reading
61	Science and health
62	Mathematics
63	Social studies
64	Physical education, intramural, and interscholastic athletics
65	Business
66	Foreign language
67	Unified arts, including industrial arts, homemaking, driver education, and mechanical drawing
68	Art
69	Music
70	Special and vocational education
	Supporting Educational Services
71	Library services
72	Guidance and psychological services
73	Medical services
74	Adult education and summer school
	Other Supporting Services
80	Pupil transportation
81	Operation and maintenance of plant
82	District management
83	Debt service
84	School lunch

Fig. 6--Pearl River program structure

five-year projection of cost out to the right of the program structure itself--the program budget. What does this reveal about the priorities within the district? Is the planner really interested in knowing how much is spent on Basic Instructional Services as opposed to Supporting Educational Services and Other Supporting Services? Is there a reasonable basis for trade-off analysis? Is there any interest in making trade-offs among these three programs? It is, of course, possible to do cost-effectiveness analysis within the programs listed under each of the broad categories. For example, how effectively is mathematics taught using the current level of resources and instructional methods? What alternative methods might be developed and evaluated? And so on. This goes back to the statement that the program structure should be designed to provide informational support for all levels of decision-making.

Analysis at this program element level is necessary. In fact, most of the "analysis" is done at this level. But, the structuring of the program elements into subprograms and then into programs that are goal-oriented increases the information needed to make broad decisions *from a more informed position*. Careful selection of the programs will immediately result in a pay-off showing where the resources are being spent.

Another question can be asked: Does the Pearl River program structure provide for imaginative change or is the status quo locked in because the program structure reflects subjects that are being taught today? The program structure should allow for growth by showing the impact of adding new "subjects" at the program element levels. The total program impact in terms of cost and effectiveness should be visible without having to revamp the basic program structure. If all the educational, or more precisely the instructional, programs are grouped together, very little additional information about the educational impact of particular changes is provided to the decisionmaker. In order to provide this information, a goal-oriented program structure is needed for the instructional activities of the district. This structure should enable the decisionmaker or curriculum developer to focus attention on more narrowly defined educational problem areas.

The same questions can be asked about the Dade County program structure shown in Fig. 7. The emphasis is on subject matter by grade level and on special programs. The Dade County program budget provides more "program" information than does the Pearl River program budget.

Instruction
- Elementary Instruction Program
- Middle/Junior High Instruction Program
- Senior High Instruction Program
- Compensatory Program
- Exceptional Child Program
- Cuban Refugee Program
- Adult Program

Instructional Support
- Supplementary Elementary Services
- Pupil Personnel Services
- Educational Media Services
- Community Services
- Instructional Development
- Staff Development
- School Food Services
- Transportation Services

Facilities Support
- Plant Operations Program
- Plant Maintenance Program
- Plant Construction Program
- Plant Security Program

Organizational Support
- Management Program
- Administrative Services Program
- Personnel Staffing Program

Fig. 7--Dade County public schools program structure

But there is still another question. Do these structures and the resulting program budgets convey sufficient information about how resources are being spent to achieve the *educational* goals of the district? Or about how well the resources are being spent? What program structure helps provide support of this nature to the educational decisionmaker? If the structure is "arranged" by level, then the assumption might well be: The goal is to advance students from one level to another. If this is the goal of education, then these program structures make some sense.

If, however, more reasonable goals can be translated into program objectives, then the activities of the educational system can be categorized into programs based on their contribution toward meeting the objectives of education.

There has to be some middle course between looking at the total instructional program cost as one lump sum and looking at the instructional program cost fragmented into a multitude of costs by individual subject. This means the effort should concentrate on developing a program structure for the instructional program, per se.

In the Rand report on program budgeting for school district planning, an attempt was made to do just that. As shown in Figs. 8 and 9, the instructional program is grouped into five major programs based on what the student is learning. The other programs concerned with the management and support of the educational process are also categorized by a commonality of purpose. In some cases, these non-instructional or non-learning based programs have objectives of their own. In other cases, workload-type measures are used as measures of program effectiveness.

The program structure of Fig. 9 provides information about the instructional activities of the district. On the other hand, the traditional budget, as shown in Fig. 10, provides information about the size of the total budget and about the line items of expenditure. It provides almost no information about what is happening in the educational component of the district's expenditure. A better picture of the difference in information content is shown in the crosswalk example in Fig. 11. Here we see the traditional budget information in the first three columns. Notice that the Account No. 200, "Instruction," is a lump sum of $15.9 million. In a program budget, the dollars shown as the total instruction line item would be shown according to the specific instructional programs of the program structure.

In. Fig. 3, shown earlier, several characteristics of a program structure were listed. These characteristics were the guidelines for designing the program structure shown in Figs. 8 and 9. In general, most of the characteristics of a good program structure are present in the program structure. The program structure allows for growth by providing stable, goal-oriented programs that are sufficiently broad

Learning Fundamental Intellectual Skills Program
  Language and Communication Skills (subprogram)
  Quantitative and Reasoning Skills (subprogram)
  Study Skills (subprogram)

Learning About the World
  Learning about U.S. and Other Societies
  Learning about the Physical World and Living Things
  Learning about Literature and the Arts
  Learning Knowledge and Skills for Everyday Application

Development of the Individual Physically, Socially, and Emotionally
  Physical Development
  Development of Means of Self-expression
  Development of Interpersonal Relationships

Learning Knowledge and Skills in Preparation for Future Employment
    or Occupational Training
  (classified by occupation)

Learning Academic Subjects to Prepare for Higher Education
  (classified by academic subject)

Assessment, Guidance, and Counseling Services

Program Development and Evaluation

Instructional Resources and Media Services

Auxiliary Services to Students
  Health Services
  Transportation
  Food Service

Community Services

Fig. 8--Programs organized by what is to be learned and by other student-oriented objectives (traditional subjects are program elements)

to encompass a wide variety of program elements (subjects, for example) in the future and still adequately definitive to provide a basis for measuring how well program objectives are being met.

In order to use the program structure as a basis for analysis at the *program* level, it must be possible to specify objective-oriented programs and measures of effectiveness, either single or multiple. It can be argued, rather strongly and rightly, that precise specification of either the objective-oriented, broad programs or their measures of effectiveness is a long way off. Specification adequate for appropriate

Program Number	*Program Description*	*Year 1*	*2*	*3*	*4*	*5*
		($ thousands)				
1	Learning Intellectual Skills	4,655	4,905	5,265	5,630	6,025
2	Learning About the World	4,445	4,785	5,130	5,484	5,875
3	Developing the Individual	2,700	2,920	3,135	3,350	3,590
4	Preparation for Employment	805	865	930	995	1,070
5	Preparation for Higher Education	665	720	765	820	880
	Direct Instruction Total	13,270	14,195	15,225	16,280	17,440
6	Assessment, Guidance & Counseling	990	1,035	1,105	1,185	1,275
7	Development & Evaluation	425	455	490	525	560
8	Instructional Resource & Media Services	250	240	260	275	295
	Instructional Support Total	1,665	1,730	1,855	1,985	2,130
9	Auxiliary Services	1,085	1,185	1,310	1,445	1,595
10	Community Services	700	110	110	115	120
11	Operations & Maintenance	2,840	3,050	3,190	3,480	3,750
12	Capital Outlay	450	725	1,325	1,695	2,195
13	Administration	2,560	2,805	3,010	3,215	3,445
	Total	22,570	23,800	26,025	28,215	30,675
	Physical Data			*Numbers*		
	Students					
	Elementary	20,000	20,510	21,510	22,180	23,070
	Junior High	7,500	7,780	8,090	8,415	8,750
	Senior High	6,500	7,070	7,355	7,650	8,155
	Total	34,000	35,360	36,775	38,245	39,775
	Teachers	1,260	1,310	1,365	1,416	1,473
	Total personnel	1,900	1,975	2,055	2,135	2,220
	Schools	45	46	47	49	51
	Square feet, in thousands	3,250	3,285	3,320	3,450	3,570

Fig. 9--Program budget example

Account Number	*Description*	*Cost ($ thousands)*	*Percent of Total Current Expense*
100	Administration	580	2.6
200	Instruction	15,945	72.2
300	Health	290	1.4
500	Transportation	280	1.3
600	Operations	1,760	8.0
700	Maintenance	915	4.1
800	Fixed Charges	1,100	5.0
	Subtotal	20,870	94.6
900	Food Service	500	3.2
1100	Community Service	700	2.2
1200	Subtotal, Current Expense	22,070	100.0
1200	Capital Outlay	500	
	Subtotal, Current Expense and Capital Outlay	22,570	
1400	Transfers	250	
	Subtotal, Expenditures	22,820	
	Reserves	3,000	
	Total, Expenditures and Reserves	25,820	

Fig. 10--Summary of traditional expenditures and reserves budget

Account Number	Account	Total	Instructional Programs[a]					Noninstructional Programs							
			1.	2	3	4	5	Assessment, Guidance, and Counseling 6	Development and Evaluation 7	Instructional Resources and Media 8	Auxiliary Services 9	Community Service 10	Operation and Maintenance 11	Capital Outlay 12	Administration 13
100	Administration	580	--	--	--	--	--	--	50	--	--	--	--	--	530
200	Instruction	15,945	4,410	4,210	2,560	760	630	915	355	215	--	--	--	--	1,890
300	Health	290	--	--	--	--	--	--	--	--	290	--	--	--	--
500	Transportation	280	--	--	--	--	--	--	--	--	280	--	--	--	--
600	Operation	1,760	--	--	--	--	--	--	--	--	--	--	1,760	--	--
700	Maintenance	915	--	--	--	--	--	--	--	--	--	--	915	--	--
800	Fixed Charges	1,100	245	235	140	45	35	50	20	10	15	--	165	--	140
	Subtotal	20,870													
900	Food Service	500	--	--	--	--	--	--	--	--	500	--	--	--	--
1100	Community Service	700	--	--	--	--	--	--	--	--	--	700	--	--	--
	Total Current Expense	22,070	4,655	4,455	2,700	805	665	965	425	225	1,085	700	2,840	--	2,560
1200	Capital Outlay[b]	500	--	--	--	--	--	25	--	25	--	--	--	450	--
	Total Current Expense & Capital Outlay	22,570	4,655	4,455	2,700	805	665	990	425	250	1,085	700	2,840	450	2,560
Percentage of Current Expense[c]		100.0	21.1	20.1	12.2	3.6	3.0	4.5	1.9	1.1	4.9	3.1	12.9		11.6

[a]Instructional Programs: 1. Learning Fundamental Intellectual Skills
2. Learning About the World
3. Development of the Individual Physically, Socially, and Emotionally
4. Learning Knowledge and Skills in Preparation for Future Employment or Occupational Training
5. Learning Academic Subjects to Prepare for Higher Education

[b]Provision of physical plant and equipment.

[c]These are percentages of "Current Expense" excluding "Capital Outlay." This conforms to current practice.

Fig. 11--Crosswalk example (in $ thousands)

analysis at the program element level is possible. In the analytic middle, so to speak, is the subprogram level. Because of these difficulties at the program level, analysis at the subprogram level offers a more productive path to getting the most out of a PPB effort.

Objectives at the subprogram level are easier to specify, measures of effectiveness are easier to determine, and both are easier to agree on. Analysis at this level should serve as a means to achieving a better definition of the goals of education and should aid the search for measures of effectiveness. This will be realized if analysis is jarred out of the comfortable area of program elements or subjects, especially out of the reading-mathematics rut.

The program structure should be designed to support analysis for educational planning. In turn, the needs of analysis should be considered in developing a program structure for education. The goal of the program structuring aspect of PPB for education is to develop a workable program structure that provides the information necessary for all levels of planning. This goal can be realized if the program structuring effort is done concurrently with the analysis of educational alternatives and with the development of an analytical capability.